decomposition rate and possibly increase the fungal growth rate.

Further studies should investigate whether flowers are in fact a preferred resource over leaves, whether ants prefer certain flowers over others if given a choice, and if there is a difference in decomposition qualities between prefered and non-preferred plant parts.

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# SELECTION OF TARGET VERSUS NON-TARGET LEAVES BY LEAF CUTTER ANTS (*ATTA CEPHALOTES*)

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*Abstract.* (MJG) Leaf cutter ants (*Atta cephalotes)* are selective in collecting leaves for their fungus gardens, and individual ants may seek out a specific resource when leaving the colony. To test this further, we hypothesized that *Atta cephalotes* would preferentially transport leaves from their target trees back to the colony. We placed both target and non-target leaves in an *A. cephalotes* foraging trail and recorded their choice of leaves. Our hypothesis was supported for a tree which was 60 m from the nest, but not for a tree which was 20 m from the nest. In both cases, ants appeared to prefer leaf fragments from the more distant tree. Though we can draw no absolute conclusions from our data, physical and chemical characteristics of leaves and distance of the target tree from the colony appear to be important to leaf preference in *A. cephalotes*,.

## INTRODUCTION (CDC)

Leaf cutter ants (*Atta cephalotes*) harvest the leaves of many lowland tropical forest trees as a substrate for growing the fungus they feed their young. If ants can distinguish leaf characteristics that enhance fungal growth, they might preferentially harvest leaves with these characteristics. Alternatively, the ants might harvest according to needs of the colony at a particular time. Stevens (1983) suggests that ants leave the colony to seek out specific food resources and that individuals on a trail towards a target tree will pick up only that resource, implying that ants harvest according to colony needs. We tested the hypothesis that leaf cutter ants would preferentially transport leaves from the tree they were currently harvesting compared to leaves from a different tree species being harvested on another trail from the same colony.

## METHODS (CDW)

We studied a leaf-cutter ant colony located on the Sirena trail, approximately 500 m from Sirena Biological Station, Corcovado National Park, Costa Rica. We followed two ant trails of this colony that led to two different tree species. The closer tree, tree A (ca. 20 m from the colony), had thicker, less flexible leaves with larger venation than did tree B (ca. 60 m from the colony).

Using forceps, we collected 20 leaf fragments from ants coming down each tree. Leaf fragments from the tree the ants were currently harvesting were termed the "target leaves" for those ants. Ten leaf fragments from tree A and 10 from tree B were placed on the path leading to tree A. The same was done on the trail leading to tree B. One target leaf fragment was introduced at the same time as one non-target leaf. Fragments were placed on the trail approximately 2 m from the base of the tree from which all ants were heading or returning. The trails had an equivalent number of ants passing a given point in both directions in a minute (path to tree A=42/min, path to tree B=47/min).

We determined whether the leaf fragments were carried away or left within a 5 min. time period. If an ant picked up a leaf fragment and moved it >40 m in the direction of the colony, we recorded the time it took for that ant to first pick up the leaf fragment.

## RESULTS (MAG)

Ants on trail A transported eight of 10 leaf A fragments and 10 of 10 leaf B fragments. The ants did not prefer one leaf

type over another (G=2.995, df=1, P=0.084). The average time to pick-up leaf A fragments was 13.8 ± 6.0 seconds (mean ± SE) and the average time to pick up of leaf B fragments was 9.8 ± 3.0 seconds. There was no significant difference between these times (t=0.916, df=7, P=0.390).

Ants on trail B did not pick up any leaf A fragments, but transported 10 of 10 leaf B fragments, showing a preference for B leaves (G=27.726, df=1, P<0.001). The average time to pick-up leaf B fragments was 16.8 ± 5.7 seconds.

## DISCUSSION (VRL)

Since ants on trail A transported both A and B leaves, they did not follow our prediction that ants will only transport target leaves. However, ants on trail B did support our hypothesis. It is difficult to draw broad conclusions from our results since we only sampled two trails of a colony.

Tree A and B differed in their distance from the colony. Kunz et al. (1994) found that ants appeared to be more selective of the leaves they transported when they were at greater distances from the colony. This finding may help explain our results since tree B, where ants transported only B leaves, was three times as far from the colony as tree A, where ants transported both leaf types.

An alternative explanation is that *A. cephalotes* is optimizing the growth of the fungus by selecting leaves with a specific chemical composition or physical characteristics (Stevens 1983). If the fungus grows better on B leaves, the ants should prefer them over A leaves. Although ants on trail A showed no statistically significant preference for B leaves, the trend was that they picked up more B leaves and picked them up more quickly. In addition, ants on trail B never transported an A leaf.

Further study should examine multiple trails at several distances from a colony. In addition, further study might examine if leaf selectivity differs with distance or physical and chemical characteristics of the leaves.

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